



Making of Breadboard Mock-U-topia Ver. 2 (No Longer Dreaming of Dreadbox Utopia)

— Project Notes —

O. Guy Morley

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Introduction

In order to take advantage of his Roland SYSTEM-1m's semi-modular capability, Roberto made a simple breadboard-based DIY project, named Mock-U-topia. His goal was to emulate some of the functions of Dreadbox's Utopia, CV-Audio Manipulator. The process has been documented as "Dreaming of Dreadbox Utopia (Making of Breadboard Mock-U-topia)." Now, he has an updated version, Mock-U-topia Ver. 2. So, we will take a look at it here.

As in the first version, Roberto referred to and used the information on the web site Kassutronics (<https://kassu2000.blogspot.com/>). He is grateful for the author. Also, most of the new components for this version were purchased at Mouser.com.

Disclaimer: Not responsible for potential negative consequences of using the information in this document.

Basic Ideas

Let us first list some of the applications in Roberto's mind:

- Manipulate the synth's random LFO in terms of the depth and level
- Use the synth's random LFO for certain modulation while using Mock-U-topia's LFO for periodical modulation
- Mix the two envelopes of the synth and use it to modulate filter, amp, pitch, etc.
- Use Mock-U-topia's square LFO to control the gate while still using the synth's LFO for modulation

- Manipulate and mix the synth's and Mock-U-topia's LFO's

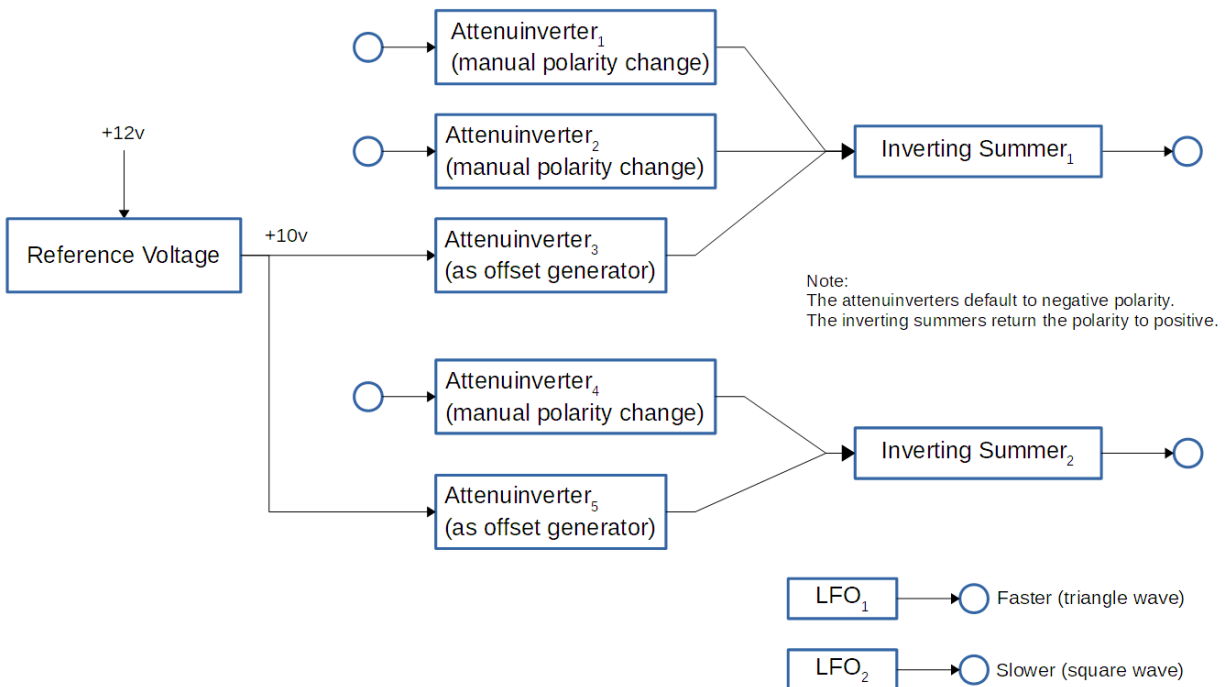
All these are supposed to be handled by this new version, carrying over almost all the basic components of the first version. Now, the main differences are as follows.

First, the new version can manipulate two separate CV's with attenuinverter and offset generator, independently. This cannot be done with Utopia. This is the kind of things better done with Tiptop Audio's MISO (actually, MISO can manipulate four CV's independently, as well as mixing them).

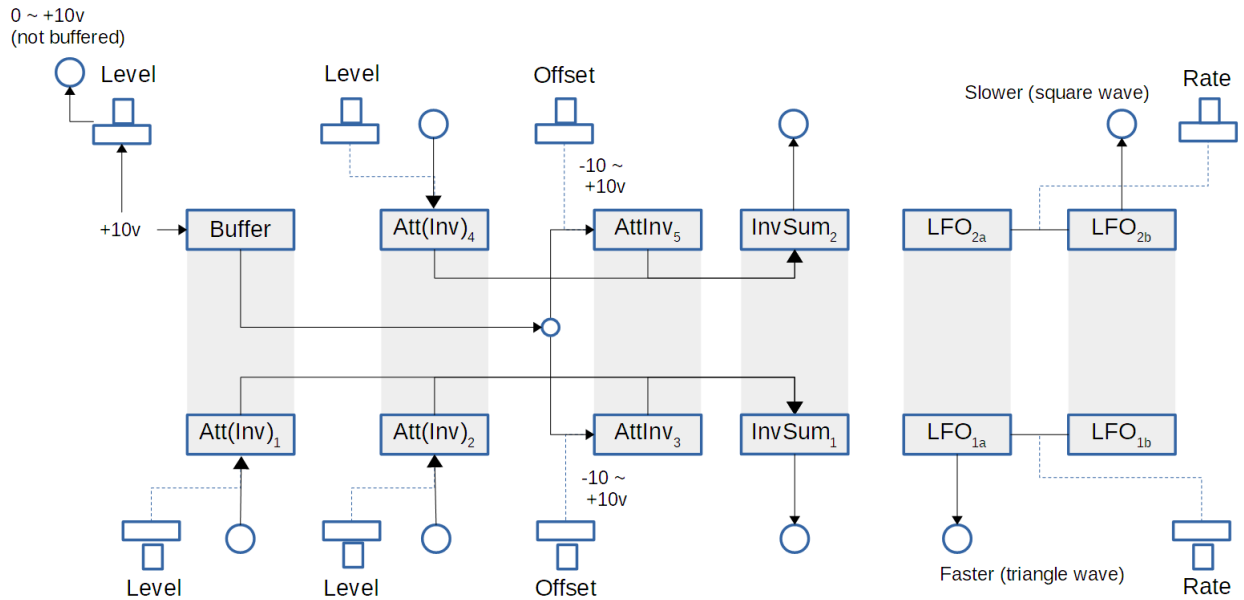
Second, as for the attenuinverters, Roberto realized that he rarely used the inverting half. So, the new version adopts a slightly different version of attenuinverter, with manual polarity change by patching on the breadboard. This way, it actually seems easier to control the positive half. Note that the offset generator still uses the original attenuinverter.

Third, Roberto wanted two LFO's, not just one.

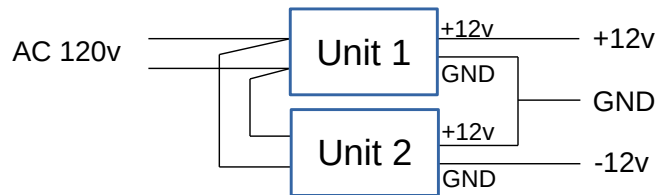
Reflecting these, Roberto came up with the following configuration.



The breadboard setup diagram is shown next. This time, Roberto chose a longer breadboard with 830 tie points to easily accommodate six LM1458N's. Note that a single dual OP amp package is shown as a shaded rectangle in the diagram.

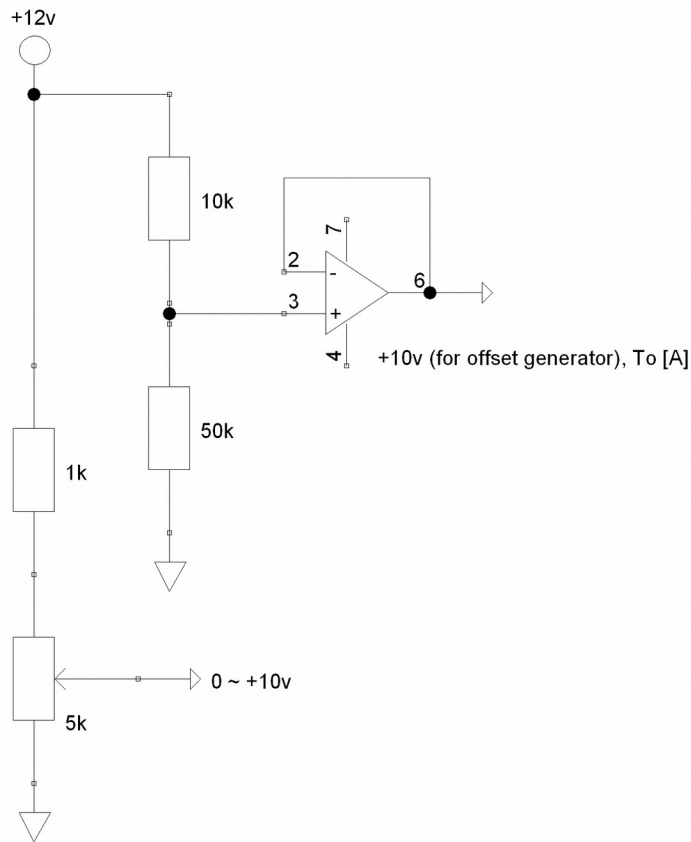


As for the power supply, Roberto kept the same units from the first version, purchased at eBay.com (seller: speedlife2011).



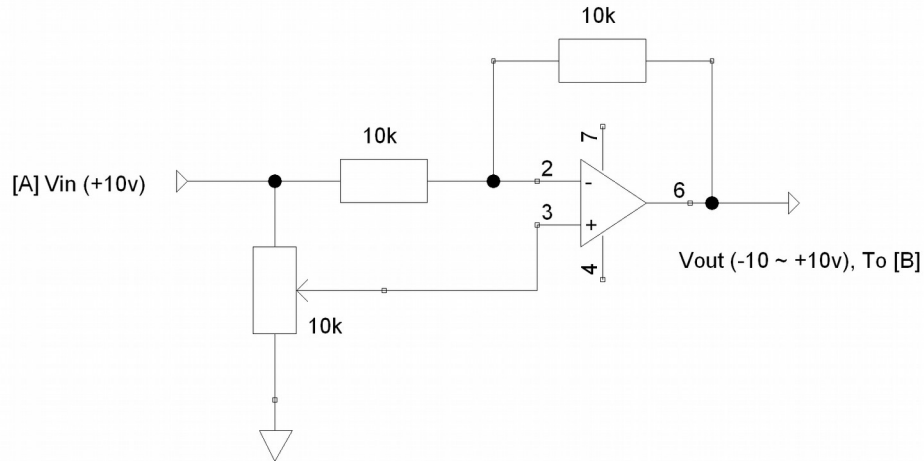
Reference/Constant Voltage Supply

The first section is the reference voltage of +10v, to be supplied to the offset generators. The output is buffered to avoid the impact of the connected sections. In addition, there is a constant voltage supply (0 ~ +10v) without buffering. Even without buffering, this would still be useful. If Roberto really needs buffering, he can also use the output of the two offset generators. The circuit diagram for this section is shown below. This time, Roberto used TinyCAD for drawing, which seemed more suited for his needs than idealCircuit (used in the previous document) or LTspice.

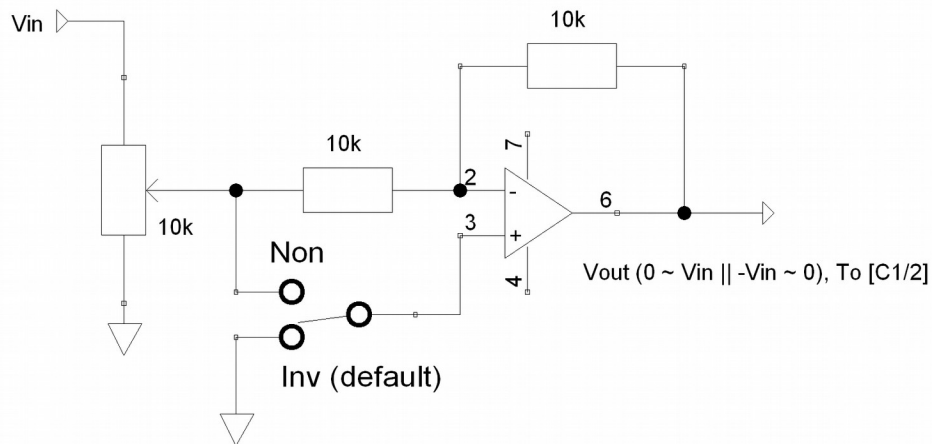


Attenuinverter/Offset Generator

For the offset generator, Roberto used the circuit from Kassutronics. He set up the potentiometer so that the full clockwise position corresponds to -10v (instead of +10v). This way, all the inputs to the Inverting summer is of negative polarity, resulting in the eventual positive output of the summer.

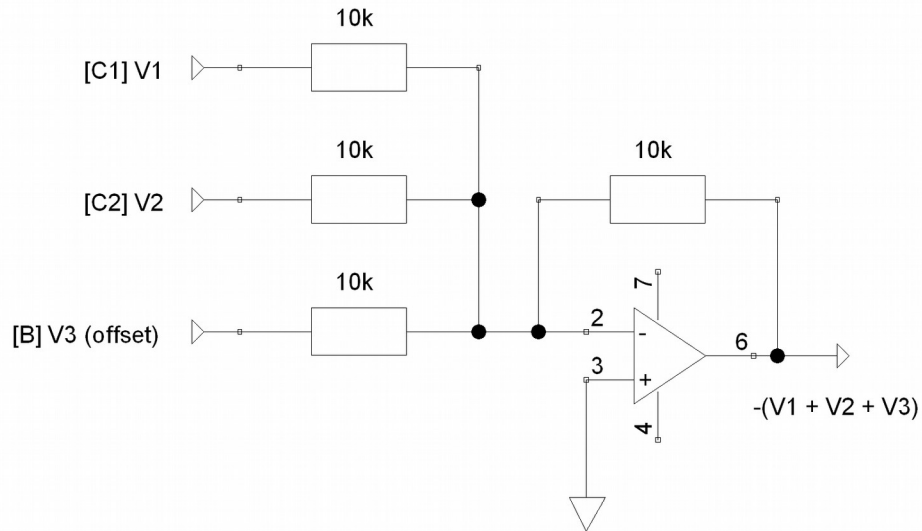


For the attenuinverter circuit, Roberto modified it slightly so that the full range of potentiometer corresponds to the positive half (i.e., just attenuation). When needed to invert the polarity, he can still change the polarity by patching.



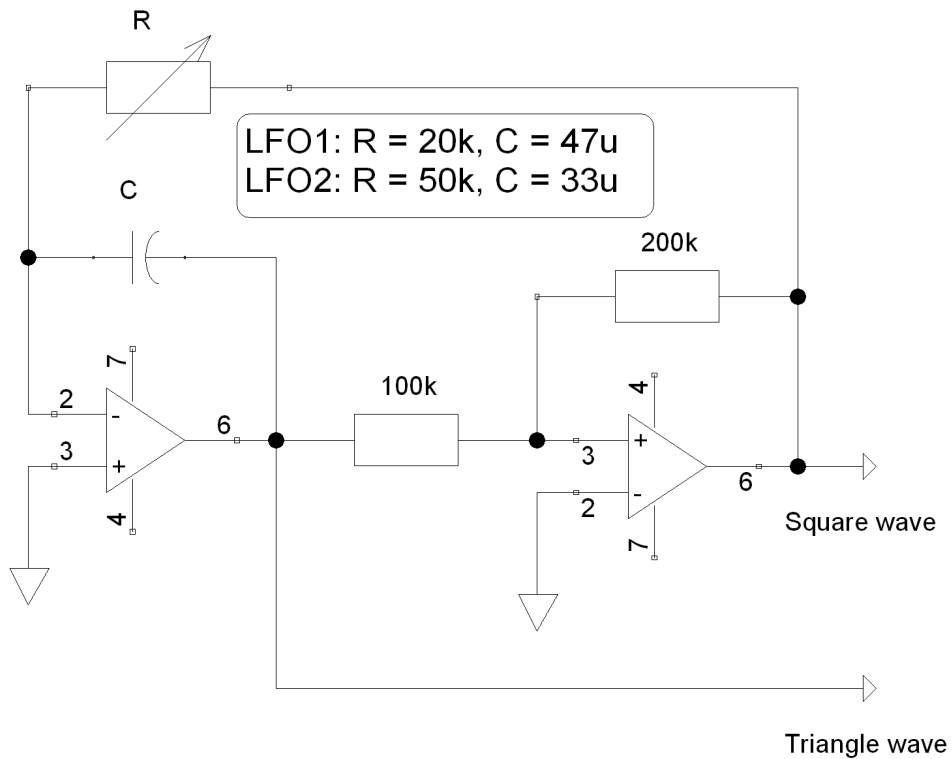
Inverting Summer

The first version used a non-inverting summer of two inputs. However, as Roberto learned the benefits of inverting summer, he chose inverting summers for the new version. One summer has three inputs (one is an offset generator) and the other has two (again, one is an offset generator).



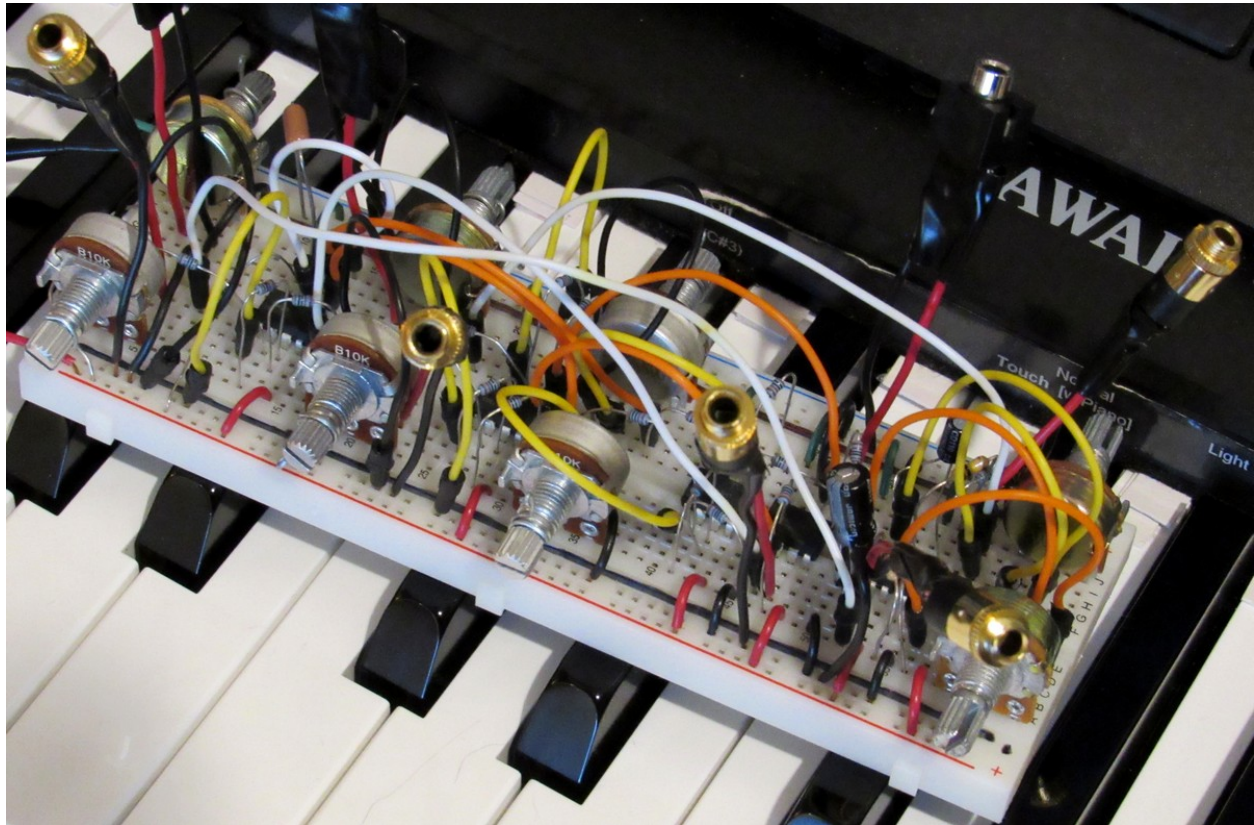
LFO

The LFO circuit is the same as the first version. But there are two LFO's now and one is preset to triangle wave (slightly faster range) and the other is preset to square wave (slightly slower range).



Final Product

The actual image of Mock-U-topia Ver.2 is shown below.



With a little more space than the first version, it does not look as cramped (maybe still too tight for some people...). As a result, it is easier to change patching as needed. Roberto is fairly satisfied with the outcome. Mock-U-topia may be ugly and awkward to use. But it is a perfect solution for Roberto.

Another possible application: At one point, Roberto was interested in acquiring Behringer CRAVE as an add-on to his SYSTEM-1m. However, one thing he noticed was that while the CV's of SYSTEM-1m are mostly in the range of -10 ~ +10v, those of Behringer CRAVE are -5 ~ +5v. Then, CV manipulators, including Mock-U-topia, must be useful for cross-patching these synths. Furthermore, it is fairly straight forward to modify Mock-U-topia so that CV be amplified, say, to boost the CV from CRAVE for SYSTEM-1m. This can be done by replacing the 10k Ω feedback resistors with 20k Ω ones (for 2x gain).